selectively adapting the response of the purchase advisor neural network for future customers in response to customer data from previous customer transactions.

Please add the following new claim 39:

--39. (New Claim) An automated sales promotion selection system comprising:

an input device that receives customer data relating to purchases of items by customers;

a computer system including a central processing unit and a storage unit including a purchase advisor neural network and a plurality of item identifiers that identify items available for purchase, wherein the purchase advisor neural network responds to customer data received from the input device by analyzing a plurality of purchase classes comprising items frequently purchased together to determine if one or more of the item identifiers stored in the storage unit corresponds to an item likely to be purchased by one of the customers and identifies a sales promotion relating to the item, and wherein the central processing unit selectively adapts the response of the purchase advisor neural network by updating at least one of the plurality of purchase classes in response to customer data; and

an output device that receives the item identifiers of the likely purchases determined by the purchase advisor neural network.--

REMARKS

This paper is submitted in reply to the Office Action dated October 6, 1999, within the three-month period for response. Reconsideration and allowance of all pending claims are respectfully requested.

In the subject Office Action, claims 1-38 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-13 of U.S. Patent No. 5,774,868 to Cragun et al. Moreover, claims 1-4, 7-12, 15-18, 20 and 22-25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,649,114 to Deaton et al. The Examiner did indicate, however, that, with the filing

of an appropriate terminal disclaimer, claims 5-6, 13-14, 19, 21 and 26-38 would be allowable.

Applicants respectfully traverse the Examiner's rejections to the extent that they are maintained.

Applicants have amended claims 1, 9, 17 and 23 and added new claim 39. Applicants respectfully submit that no new matter is being added by the above amendments, as the amendments are fully supported in the specification, drawings and claims as originally filed.

Now turning to the Office Action, the Examiner the first objected to the drawings and required Applicants to submit a proposed drawing correction in reply to the same. Given, however, that the only objections to the drawings were to the margins of several figures, Applicants respectfully submit that no substantive corrections of the drawings are required. Accordingly, no proposed corrections are submitted herewith at this time. Applicants will forward formal drawings incorporating the requested corrections upon allowance of the application.

Next in the subject Office Action, claims 1-38 were rejected under the judicially created doctrine of obviousness-type double patenting. While Applicants maintain their traversal of this rejection, Applicants will file in due course a terminal disclaimer as requested by the Examiner. Accordingly, withdrawal of the rejection is respectfully requested.

Next in the subject Office Action, claims 1-4, 7-12, 15-18, 20 and 22-25 were rejected as being unpatentable over Deaton et al.

The claimed invention in one aspect is directed to an automated sales promotion selection system used to identify items that are likely to be purchased by customers so that marketing efforts directed to those customers can be specifically tailored to improve the efficacy of a marketing endeavor. Turning first to the rejection of claim 1, this claim recites (in part) an automated sales promotion selection system that incorporates a purchase advisor neural network that (1) responds to customer data received from an input device by determining if one or more item identifiers stored in the system corresponds to an item likely to be purchased by a customer and (2) identifies a sales

promotion relating to the item. In addition, a central processing unit in the system selectively adapts the response of the purchase advisor neural network in response to customer data.

The response of any computer logic, including a neural network, generally refers to the rules embodied in the logic that determine what output is generated in response to specific input. As such, by selectively adapting the response of a neural network, as in claim 1, the underlying rules embodied by the neural network are, in effect, adapted to essentially optimize the performance of the automated sales promotion selection system over time, such that future sales promotion selection operations performed by the system are more effective. To clarify that the future response of the neural network is adapted, claim 1 has been amended to clarify that the selective adaptation affects the response of the neural network for future customers (which could also include future selections for the same customer as well).

The Examiner relies on Deaton et al. for teaching a system that identifies a sales promotion for an item likely to be purchased by a customer. The Examiner also asserts that Deaton et al. discloses a selectively adaptable system. However, the Examiner admits that there is no teaching in Deaton et al. for the use of a neural network in a sales promotion selection system. Instead, the Examiner relies on official notice, stating that neural networks are well known in the art and are known to be useful in the analysis and determination of relationships and patterns.

Contrary to the Examiner's assertions, however, Applicants respectfully submit that the Examiner has failed to support a *prima facie* case of obviousness.

First, Applicants respectfully submit that the Examiner has failed to adequately support the contention that the use of a neural network in a sales promotion system is obvious. A *prima facie* case of obviousness requires a suggestion in the art of the desirability of making a combination, i.e., in this case a motivation to utilize a neural network in the selection of sales promotions. In this case, the Examiner merely relies on official notice to establish that neural networks are generally known. There is no evidence on the record, however, of any motivation to apply a neural network in the specific application of selecting sales promotions. If the Examiner maintains the

rejection, Applicants respectfully request that the Examiner provide Applicants with either a reference or an affidavit by the Examiner to provide evidence of such motivation, pursuant to MPEP 2144.03. Absent adequate evidence of such a motivation in the art, however, Applicants submit that a *prima facie* case of obviousness cannot be maintained.

It is important to note that Applicants are not claiming neural networks in the abstract -- only the specific application of a neural network in an automated sales promotion selection system. There has been no showing that the prior art recognizes the desirability or utility of a neural network in this specific application, and as such, the rejection cannot be maintained.

The Examiner seems to take the position that because neural networks are known, all applications of such neural networks would be obvious. This is akin to stating that since transistors are known, all combinations of such known transistors would be obvious. However, when a combination of transistors results in new utility and distinct advantages over prior art systems, such a combination can be patentable. Likewise, in this instance, the use of a neural network to provide the identification of items likely to be purchased by a customer and the identification of a sales promotion relating to such an item are specific applications of a neural network that are not disclosed or suggested by the prior art of record. Furthermore, given that the use of a neural network in an automated sales promotion selection system as recited in claim 1 provides a unique advantage in terms of the adaptability and automated optimization of sales promotion selection, Applicants respectfully submit that the claimed combination is non-obvious over the prior art of record.

Second, Applicants respectfully submit that, contrary to the Examiner's assertions, Deaton et al. does not teach or suggest the selective adaptation of the response of a system in response to customer data. Claim 1 specifically recites selectively adapting the response of a purchase advisor neural network for future customers in response to customer data. As discussed above, a neural network's response is essentially the set of rules that the neural network embodies to determine what outputs occur responsive to given inputs. As such, adapting the response of a neural network often incorporates modifying the underlying rules employed in the neural network.

The Examiner relies on column 71, lines 13-17 of Deaton et al., which discusses changing a marketing program for a customer based upon that customer's subsequent performance. While the marketing program for a particular customer may be changed in response to customer purchases, however, the underlying response, or rules, implemented by the Deaton et al. system are not modified.

The Examiner's attention is directed specifically to columns 118-125, and the accompanying Figures 46A-B and 47 in Deaton et al., for a discussion of "echo" coupons that are issued by the Deaton et al. system responsive to items previously purchased by a customer. From the cited columns in Deaton et al., it is evident that the underlying rules relied upon by the Deaton et al. system do not change -- any feedback such as past purchases or redemptions of incentives are treated as inputs so that the application of the same rules to the different inputs results in different outputs.

Specifically, as discussed starting at column 121, line 54 of Deaton et al., a set of exemplary rules are presented to determine how an "echo" coupon is generated for a particular customer transaction. It should be noted that different customers will be handled in different manners based upon the data associated with each of the customers. Moreover, as a customer's purchase history and redemption of previous incentives develops over time, the application of the rules to a particular customer transaction will change the incentive selected for that customer. At no time, however, are the rules themselves adapted in response to customer data.

To further illustrate the distinction between a selective adaptable system (e.g., as recited in claim 1) and a non-adaptable system that simply adjusts its output responsive to past activities by a customer (e.g., as disclosed in Deaton et al.), consider a marketing system that employs a rule that states that a particular type of customer should receive coupon A if that customer purchased a particular product within the last X days, otherwise the customer should receive coupon B. In both an adaptable system and a non-adaptable system, the output of each system will vary between first and second selection operations for a particular customer if, for example, as of the first selection operation, the customer has bought the product in the last X days, but at the time of the second selection operation, the customer has not. In an adaptable system, however, a further functionality

may be supported whereby the value of *X* could be modified between the first and second selection operations so that the rule applied during the second selection operation is effectively different than that applied in the first operation. A non-adaptable system such as Deaton et al., however, is not capable of supporting such functionality.

As such, Applicants respectfully submit that Deaton et al. fails to disclose or suggest selective adaption of a selection system responsive to customer data, and as a result, a *prima facie* case of obviousness cannot be made as to the claimed combination.

Applicants therefore respectfully submit that claim 1 is non-obvious over the prior art of record. Reconsideration and allowance of claim 1, as well as of claims 2-8 which depend therefrom, are respectfully requested.

Next, with respect to each of independent claims 9, 17 and 23, these claims similarly recite the use of a purchase advisor neural network that is selectively adaptable in response to customer data. Moreover, each such claim has been amended to clarify that the response of the purchase advisor neural network is selectively adapted for future customers. Claims 9, 17 and 23 are therefore patentable over the prior art of record based upon the same reasons set forth above with respect to claim 1. Reconsideration and allowance of claims 9, 17 and 23, as well as of claims 10-16, 18-22 and 24-26 which depend therefrom, are therefore respectfully requested.

Applicants also wish to separately address the patentability of claim 4, which specifically recites that the response of the purchase advisor neural network is selectively adapted by updating at least one of a plurality of purchase classes based upon purchase data from previous customer transactions. The purchase classes comprise items frequently purchased together, such that an item likely to be purchased can be determined by locating items in selected classes that are missing from a set of items purchased by a customer. The selective adaptation of the purchase classes results in the members of one or more classes being modified responsive to previous customer transactions.

The Examiner does not separately address claim 4 in the Office Action. However, Applicants respectfully assert that the cited reference, Deaton et al., does not disclose or suggest this selective adaptation of purchase classes. The cited passage relied upon by the Examiner in making the rejection is directed to changing the value of an incentive

responsive to whether the customer redeems a prior incentive. There is no disclosure or suggestion in Deaton et al., or elsewhere in the prior art, for modifying the members of a purchase class to vary the response of a sales promotion selection system. Accordingly, reconsideration and allowance of claim 4 are respectfully requested.

As a final matter, the Examiner will note that Applicants have added new claim 39, which, similar to claim 4, recites updating one or more purchase classes to adapt the response of a purchase advisor neural network. Applicants respectfully submit that claim 39 is also novel and non-obvious over the prior art of record for the reasons presented above with respect to claim 4.

In summary, Applicants respectfully submit that all pending claims (claims 1-39) are novel and non-obvious over the prior art of record. Reconsideration and allowance of all pending claims are therefore respectfully requested. If the Examiner has any questions regarding the foregoing, or which might otherwise further this case onto allowance, the Examiner may contact the undersigned at (513) 241-2324. Moreover, if any other charges or credits are necessary to complete this communication, please apply them to Deposit Account 23-3000.

Respectfully submitted,

6 JAN 2000

Date

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